Fast, Flexible, Adaptive Channel Coding with Near-Shannon-Limit Performance

Award Information
Agency:
Department of Defense

Branch
Office of the Secretary of Defense
Amount:
$97,787.00

Award Year:
2003
Program:
SBIR

Phase:
Phase I
Contract:
FA8750-04-C-0027

Agency Tracking Number:
O032-1047
Solicitation Year:
n/a

Solicitation Topic Code:
n/a
Solicitation Number:
n/a
Small Business Information
0 DB CODING, INC.
3 Annette Drive, Athens, OH, 45701
Hubzone Owned:
N

Minority Owned:
N
Woman Owned:
N

Duns:
140063665

Principal Investigator:
Jeffrey Dill
President
(740) 594-2308
dill@ohio.edu

Business Contact:
Jeffrey Dill
President
(740) 594-2308
dill@ohio.edu

Research Institution:
n/a
Abstract
The work proposed here presents a novel approach to channel coding which will provide flexibility and robustness which are necessary to alleviate many significant limitations in current RF communication systems. The proposed approach is entitledTail-Biting Circular-Trellis Block Coding (TBC2). This family of coding methods provides unique advantages in the tactical military communication environment and in fact achieves the required fast, flexible, adaptive channel coding with near-Shannon limitperformance.In particular, the coding approach presented here provides the following key advantages over other approaches:1. Near-Shannon Limit bit error performance2. Low latency, achieved by using very short codewords3. High adaptivity in the dynamic selection of codeword size and code rate4. Efficient decoding, using a highly parallel decoding algorithm and few iterationsTaken together, the features of this code will provide a new level of agility and robustness for future battlefield communication systems, allowing the system to adapt to the highly dynamic nature of channel characteristics, quality of servicerequirements, latency requirements, and available frequency bands.

* information listed above is at the time of submission.